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lect heads always for the living reality of things, but, finding each next advance more arduous than the last, stops always at an approximation of that last truth which one bold, keen intuition suggests but can never quite lay bare. Could two theories of the concept differ more in spirit?

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ON CONTINUITY AND DISCRETENESS

IT would hardly be an exaggeration to say that the whole logical crux of metaphysics centers in the problem of continuity and discreteness. Whether one approach this problem with the emphasis on the relation of the one and the many, or on the relation of permanence and change, the same duality breaks out—either in the static antithesis of unity and manifoldness, or in the dynamic antithesis of the continuity which is permanence and the discreteness which is change.

Abstract monisms, from Parmenides to Spinoza, regard ultimate reality as a homogeneous and unchanging continuum, in which the whole is both logically and existentially prior to the parts. The most obvious empirical source of this view is the apparent homogeneity, unity, and permanence of pure space. Parmenides describes the One in spatial terms. Spinoza conceives the one substance as an infinite whole and it is no accident that he develops his system *more geometrico*. I do not, of course, mean to imply that Spinoza's substance is simply space emptied of all content, but only that the geometrical metaphor plays a large part in his conception thereof.

All forms of pluralism, on the other hand, have found a chief determining motive in the analytical dissolution of the perceptual continua of the space-time world, and, especially, of movement and change, into discrete elements, or "terms," and "relations." Continuity seems thereby to be reduced to a more and more relative and transitive position. In Leibniz, who formulated the law of continuity, there is the closest possible connection between his dynamic pluralism and his mathematical analysis, devised to obtain formulas for the calculation of continuous variables.

The progress of science seems to consist in the breaking up of the perceptual continua of immediate experience into discrete elements and events. Physics, chemistry, biology, and psychology pulverize the continua of space and motion, physical and vital processes, and consciousness, respectively. The analytic side of science brings out discreteness in experience, and, by a one-sided emphasis on this analytic function of thought, one gets the conclusion that the result of the operations of intellect on experience is a world of pure discreteness, of discontinuities and lack of connection everywhere. If thought be powerless to grasp or find continuity, then the sole function of the logical intellect is to rend the living unity of experience in pieces, and to transform its movement into an inert and powerless set of terms and external relations. The world, as seen by the intellect, becomes a lifeless and motionless wreck of the actual living and evolving universe. We get, indeed, a "pluralistic universe," but a dead one. This procedure amounts to the assertion that, for the intellect, there is no identity-in-difference, that difference is eternally difference and identity eternally identity, and that in thought they never live and work together or *durcheinander*. Would we restore the world that hangs together, that lives and moves, would we restore the continuity which the intellect has banished from our actual world, then we must hark back to immediate intuition, to sense and feeling, fling ourselves into the stream of immediately experienced becoming and listen with ears attent to its intellectually inarticulate murmuring. Here is the only anodyne draught for the pains of a world torn asunder by the intellect. Here the discontinuities cease from troubling and the antitheses are at rest.

Such is the proposal of M. Henri Bergson, whose praises are sung by Professor James in his "Pluralistic Universe." Mr. James tells us again, in this JOURNAL, that the two horns of the philosophical dilemma are now Bradley or Bergson.[1] Both have shown in somewhat different ways the powerlessness of the intellect to apprehend reality. Both have been in at the death of post-Kantian rationalism; but they differ as to the way of philosophical salvation.

I can not admit that philosophy is shut up with this dilemma. It is not in the desperate *impasse*, where it must either divest itself of all its intellectual habiliments and plunge naked into Bergson's current of immediate feeling, or by a process of "transmutation" grow wings and soar into the mystical Absolute Experience of Bradley.

Bergson's conception of thought, which Mr. James seems to accept *in toto*, is that it is powerless to grasp the real flux and evolution of things, the real variety and novelty in change. Thought can make only a series of static cuts through the real flow of becoming. Its reflective renderings of the evolutionary process are like the geometrical point and line of the traditional text-books. These cuts have no breadth and no synthetic grasp of change. The illusion that science grasps the real is due to its presentation of a rapid succession of static pictures in its concepts or symbolical formulas. These concepts may seem to glide into one another like moving pictures, and thus to give a semblance of life, but it is only a semblance. This "cinematographic" character of thought renders it forever impotent to seize the elusive and slippery reality of pure becoming.

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[1] This JOURNAL, Vol. VII., pp. 29–33.

The metaphor is *frappant.* All the world knows about moving pictures, and Bergson's great literary genius beguiles the unwary reader. Intellect, Bergson holds with the pragmatists, has the purely practical function of helping us to act efficiently. And its work is retrospective, whereas life and all reality are prospective. Thought generalizes from the past. It conceptualizes the dead remains of actions and enables man to adjust himself to the future, because of a partial continuity of past and future. But thought operates only on the by-products of the life-force's alchemy. Thought assumes complete continuity between past and future, a continuity that does not exist. The *élan vital* is ever bringing forth the new.

There are, it seems to me, several fatal objections to the Bergsonian theory of the functions and limitations of intellect. If evolution or pure becoming be real, it is certainly not discovered by sense-feeling or intuition. Immediate experience does not, by itself, yield the notion of cosmical evolution, nor, indeed, of any of the forms of continuity which are true for science at least, whatever may be their place in the Bergsonian metaphysics. There is no immediately perceived continuity of the acorn with the oak, or of the jelly-fish with the mammalia. Even the continuity of anthropoid ape with man has never been very obvious to the casual observer unequipped with the categories of biological analysis and synthesis. Any theory of evolution, like any other great scientific generalization, such as the law of gravitation or of the conservation of force, is a principle of continuity operative within a certain field of experience, and fashioned by the activity of the intellect in its quest for continuities and identities that are not patent to sense-perception and immediate intuition. So far is it from being true that the outcome of intellectual activity is solely the breaking up of the primitive continuities of immediate experience into discrete elements, that in fact the actual work of intellect is synthetic as well as analytic and consists quite as much in linking the immediately discrete by threads of continuity unearthed by a reflective quest.

In practical life, too, thought functions to bridge over discontinuities. The hungry man, the money-seeker, the lover, exercise their intellects to devise means for overcoming the discontinuities between their desires and the situations which hinder the satisfaction thereof.

Bergson is captivated by his metaphors into a caricature of the nature and function of the intellect. He really limits its activities to the sort of work which consists in the analysis *ad indefinitum* of a continuous line, a motion, or a change, into infinitesimal elements. He envisages continuity as that of the spatial line or motion, and discreteness as the analysis of the line into an indefinite series of points, or of the motion into a series of static positions *à la* Zeno the Eleatic. And Mr. James appears to follow him in this respect. Accordingly, the function of intellect being limited to the never-ending chase for the infinitesimal, and the poor intellect being able, when out of wind, to rest only on a static term, the only escape from the Zenonian paradoxes seems to be to affirm that thought distorts reality, to cry avaunt! false intellect, and plunge in the stream of sensation and feeling. In spite of intellectual analysis, we see the continuous line and it is safe to bet that Achilles will overtake the tortoise.

I will not take up space here to discuss the Zenonian paradoxes. It is unnecessary to do so. The modern mathematical treatment of the continuum as a type of serial order turns the flank of these paradoxes. What Zeno's arguments really prove is that infinitesimals are not actualities. The successive positions of Achilles and the tortoise, or of the moving arrow, would be actual infinitesimals, if a finite motion or distance were really made up of an infinitude of static positions or of points without length. Any "here" and "now" of motion or change is not absolute rest. It is a term in a continuous series, defined by its relations to the terms before and after it in the same series. The analysis may be stopped just where it suits our purpose, but the serial continuity, the ordinal synthesis, is always involved.[2]

The position of Messrs. Bergson and James encounters a further difficulty in their account of thought's practical function. Thought breaks up the continuities of sense and feeling into discrete elements; but the function of thought is to enable one to adjust one's self to new situations, by formulating, from the retrospective interpretation of past experiences, plans of action for the future. The possibility of this successful prevision and adjustment implies a continuity of past and future that thought is able to apprehend. Furthermore, the actual process of evolution either has continuity of an intelligible sort, or one is not entitled to speak of it as an evolution or as one cosmical movement of pure becoming. One has no right, in terms of discourse with one's fellows, to argue that the new is ever coming forth in this one process unless one is prepared to show intelligible order and continuity between new and old. The hackneyed principle that the changing implies the permanent, is in place here. In fact, Bergson does assume an ill-defined continuity or order and elaborates it by the resources of intellect.

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[2] I may refer, for further discussion on this point, to B. Russell, "The Principles of Mathematics," especially Chapters XXII., XXXVI., XLII. and L.

I think that Messrs. Bergson's and James's caricatures of the functions and operations of thought are due to a one-sided dwelling upon the aforementioned puzzles of mathematical continuity and discreteness, and that this has blinded them to the actual function of thought in concrete experience and in the empirical sciences. Thus they have been led to set up a false opposition between sense-experience and reflective thinking. I will repeat here what, it seems to me, should now be taken as a truism, namely, that there is no bit of significant experience of which we are reflectively aware that is not shot through with thought. There is no such thing as an utterly relationless experience. The intellectual element may not be prominent, but it is always there. When reflective thinking begins to be in evidence it neither descends from a rationalist heaven nor is born by a miraculous parthenogenesis. At the other end of the scale, I should suppose that, while we all stand in constant danger of hypostatizing abstract concepts, we all recognize, in principle, that "concepts without percepts are empty," and, further, that concepts are nothing other than symbols of the actual continuities of experience.

I can not, then, admit the horn of Mr. James's dilemma which would drive philosophy to save itself by swallowing Bergson's prescription and committing intellectual suicide.

Nor is philosophy compelled, if it revolt from Bergson's proposal for its euthanasia, to choose Mr. Bradley's way. He has, indeed, performed a brilliant *tour-de-force* by isolating, successively, the main general features of experience, such as space, time, causality, the self, and then showing that each of these features, when taken thus by itself, fails to be self-sustaining and hopelessly falls apart into the indefinite regress of terms and relations. One can, indeed, if one will, take abstract space or time or causality, demand that it shall stand by itself apart from the organic totality of experience, and then with this abstraction go on thinking terms and relations as long as one pleases to continue the game. The process has no necessary end. One begins with the assumption that space, time, causality, change, etc., pretend in naïve thought and science to be absolute and self-existent, and one easily shows that, on this assumption, these aspects of experience fall into the indefinite regress of terms and relations. And if qualities and relations are mutually implicatory, of course neither can stand without the other. But, if there are no intelligible qualities without relations, and *vice versa,* why is not the real in experience simply the organic and functional complex of qualities and relations? If there are no really external terms subsisting without relations, and no relations that hang in the empty void between, but not connecting, terms, then while thought does not create experience *ex nihilo,* experience is intelligible. Mr. Bradley's conclusions that all the aspects of experience break up by an endless process of fission, seem to me to be successfully deduced because they were carefully put in with the initial assumption. Why begin with this process of isolation of aspects of experience from the concrete whole of experience? Why demand of thought the impossible, and, to my mind, arbitrary, achievement of either *being* the whole reality to which it refers or confessing itself powerless to grasp the real? I may be simply confessing that I am a hopeless Philistine in philosophy, when I say that I am unable to see either that thought is *ipso facto* bankrupt if it is not immediately one with everything that it knows, or that a world of elements in organic relations is a contradictory and unintelligible conception.

To Mr. James's dilemma of Bradley or Bergson I reply, neither Bradley nor Bergson! What then? I have space only to answer very briefly. The best way for philosophy seems to me to be an organic or functional and social conception of experience, and, by consequence, of reality, since the latter can mean no more than the ultimate unity and continuity of experience; this organic whole of experience thought grasps or significantly refers to reality, since thought is an integral function of the system of experience, functioning in and through certain constituent dynamic elements of reality, namely, selves. Thought is a function of the organic whole of reality, a function which inheres in and operates through conscious individuals. I see no need or sufficient ground for sundering the thinking self from its world; no ground for sundering immediate experience from conceptual reflection; and, finally, no ground for admitting that sense and feeling, when contrasted with systematic thinking, yield the true and final continuities of experience, whereas thought is tied up to discretions.

Perhaps, in conclusion, it may be well to summarize what appears to me to be the logic of the situation. A theory of thought which makes its function to consist in the separation of bare identity from blank difference is a caricature of thought's work. To reason or think is to connect things and to differentiate them in the same breath. To relate implies that there are actual differences or terms to be related. To really distinguish things is to find them together, as members of a common field of experience. Even the proposition "*A* is *A*" either means that the predicate is the subject with a difference or it is solemn nonsense. Philosophy does not get out of the supposed deadlock between the discrete and the continuous, the one and the many, either by throwing away one term of the antithesis, or by plunging headlong in the pre-reflective stream of crude sense-experience. There is no need to resort to this heroic remedy. The intellect is not tied up to that logical man of straw, either absolute identity and continuity or absolute difference and discreteness. The intellect itself demands both, and sensible experience already contains them both, though in a less fully articulated form. Sensible experience is never wholly innocent of thought. The logically formulated relations of continuity in discreteness are simply the warp and woof in the common texture of experience, when risen to reflective awareness of itself. In the sensibly continuous masses of primitive experience, such as the continuum of perceptual space, or of spatio-temporal movement, the continuity in question is only relatively undifferentiated. Even in the perception of a simple movement in space there is present the recognition of discreteness in starting-point, direction, and goal. It is the work of reflective thinking to develop to fuller awareness the continuity in discreteness of experience. As this work is done, the primitive continua are transformed, not into pure discretions, but into other types of continuity, such as the continuity of equivalent forces, of gravitational attraction, of natural selection, of purposive thinking, etc. The difference between immediate sensible experience and the same experience when worked over by thinking, is not that the continua of the former have given place to the rags and tatters of thought's analysis, but that the broken and episodical continuities of sense have been supplanted by more comprehensive and persisting principles of continuity. Thinking does show up in a brighter light the discreteness of individuality in things and persons, but it likewise shows that the discrete individualities, so defined, carry all the more intimately the continuities. Contrast the continuity of the natural order for the modern student of science with the chaotic world or the savage!

Thinking that is adequate to the actual content of experience is always a movement which unites in differentiating, and differentiates in uniting, things. It is a movement which develops to explicit awareness the actual continuities or relationships of discrete moments or terms. Reality is intelligible, for it is at once continuous and discrete. And the continuity of the real can not be the mechanical and external continuity of disjointed elements merely juxtaposed in space. The continuity of the real is dynamic or living identity unfolding itself in a system of differences, persistently differentiating itself through change or qualitative development. It is true that the qualitatively new is a feature of actual experience. On the other hand, change or differentiation is unthinkable, even as sensational experience, without continuity.

As we move on, in thinking, from blind and dumb sensation to reflective experience, by a progressive differentiation, it becomes clearer that the continuity which involves discreteness must always be that of a unity of significant or teleological process. It is the synthetic movement of living experience and purposiveness which reveals the continuity that lives and works in and through discreteness. So far we can go with M. Bergson; but we do not admit that his method is the one by which we can best understand the meaning of the purposive process of reality.

Finally, there is no inscrutable mystery in the principle that adequate thinking of the real requires continuity in discreteness, if the developing world be a living and teleological system. For thinking is just the increasing awareness that such a world gains of itself.

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SOCIETIES

SECTION OF ANTHROPOLOGY AND PSYCHOLOGY OF THE NEW YORK ACADEMY OF SCIENCES

IN conjunction with the New York Branch of the American Psychological Association, a meeting was held on February 28, 1910, at 8:15 P.M., at the American Museum of Natural History. The following program was presented:

Psychological Measurements of the "Pulling Power" of an Advertisement: Dr. H. L. HOLLINGWORTH.

The speaker discussed the defects of modern methods of "keying" an advertisement, and advocated the substitution of psychological tests. The results of an experiment with seventy-five subway advertisements, by the order of merit method, were presented. In cooperation with the New York Advertising Men's League, the keyed results of various kinds of "copy" are being compared with psychological measurements of the same advertisements. The work in progress is directed toward four chief problems: (1) the validity of individual judgments of persuasiveness; (2) the relative strength of the various human instincts as the basis of appeal and conviction; (3) the relative strength of various "effective conceptions"; (4) the practical psychology of color in advertising.

Practise and Individual Differences: Dr. FREDERIC LYMAN WELLS.

In thirty days' practise with five subjects on the number checking